

# Effect of COVID-19 Pandemic on the Mental Health of Healthcare Workers

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## Abstract

**Background:** The novel coronavirus 2019, or COVID-19, has gripped all corners of the world and has created a crisis that significantly affected people's mental health around the globe, including healthcare workers (HCWs).

**Purpose:** This study aimed to bring the results to the attention of healthcare systems' policymakers and managers so as to fully recognize the severity of the situation and set the groundwork for appropriate interventions to address the condition of HCWs.

**Methods:** This systematic review searched PubMed, Google, Google Scholar, and Scopus for literature relevant to mental health conditions among healthcare workers during this pandemic. This review includes the searches from March to October 2020.

**Results:** The main findings were symptoms of anxiety, depression, stress, psychological trauma, insomnia and sleep problems, burnout and fatigue, and distress. Most studies suggest that social and family support, hygiene measures, and physical activity are safeguards for mental health and are among the recommended protective interventions for promoting mental health.

**Limitations:** The researcher has reservations about the findings' generalizability as the samples may not represent the population.

**Conclusion:** This review highlights the existing burden of mental health conditions reported by HCWs during the COVID-19 pandemic. It revealed consistent reports of stress, anxiety, and depressive symptoms resulting from COVID-19.

**Keywords:** COVID-19 pandemic, mental health, healthcare workers

**Implications:** Longitudinal data will be helpful through surveys of representative samples of the general population. More relevant and recent data in Asian countries could inform understanding of challenges concerning COVID-19 and the impacts on healthcare workers' mental health and well-being, particularly those in the Philippines.

The World Health Organization (WHO) declared an international public health emergency in March 2020 due to the massive spread of the much-dreaded novel coronavirus (COVID-19). Healthcare workers (HCWs) have been placed in the direct care of patients before. They are again called upon to play

a vital role in responding to the COVID-19 pandemic. The WHO (2020) reported the complexity of HCWs' psychological response to the epidemic of infectious diseases. This observation is secondary to a myriad of factors, such as feelings of vulnerability, loss of control, concerns about one's health, possible infection of colleagues and family, fear of death, and isolation.

Some aspects of the COVID-19 pandemic intensified its potential to cause mental health issues among healthcare workers. For one, there is fear of the notion that "no one is safe" due to the astronomic rise in the number of cases reported and countries affected. Media reports compounded its spread in the hospital community and other healthcare facilities with increased death rates among HCWs. Due to the sudden spike in infections, much medical staff was reassigned to higher-risk frontline jobs causing disruptions in standard workplace practices. The WHO called for a collective effort to alleviate the impact on healthcare workers (WHO, 2020).

HCWs, as a result, are highly susceptible to experiencing psychological and mental problems. The preceding suggests that psychological support and interventions should be made accessible to healthcare providers to help ensure the effective execution of their job. Mental health issues like stress, anxiety, and emotional exhaustion affect staff morale adversely, resulting in absenteeism, high turnover rates, and reduced work satisfaction and quality of care. In this critical situation, the medical staff's mental health should be considered an urgent public health concern. It is, therefore, necessary to prioritize the mental health of our HCWs and support the mitigation of the adverse psychological impact of the COVID-19 pandemic.

Understanding the risks and impacts on healthcare workers' mental health during this COVID-19 pandemic cannot be ignored. This review will investigate the articles addressing HCWs' mental health status during the SARS-CoV-2 outbreak. It aimed to identify, assess, and summarize current evidence on COVID-19 and its impact on healthcare workers' mental health. It focuses on their mental health issues and will, hopefully, contribute to informing where interventions and organizational efforts can support their mental health. Moreover, this initiative needs immediate attention and action, particularly in countries like the Philippines, where healthcare workers struggle against violence and discrimination, on top of the delay in compensation and release of their hazard pay (Philippine Star, January 31, 2021).

This review attempted to address the following questions: 1) After a few months into the pandemic, what is the current status of the COVID-19 research on healthcare workers?

2) Among these types of workers, how impactful is the COVID-19 pandemic in worsening their mental health?

The secondary data gathered was saved in a secured google folder accessed by the researcher only, and sharing of secondary data was not allowed. The study was submitted to the Fe del Mundo Medical Center Institutional Review Board (FMMDC IRB) and was approved for exemption from review. Any leak of information will be reported to FDMMC IRB. Actions following Philippine Health Research Ethics Board (PHREB) and institutional IRB guidelines will be applied if there is any information leak.

## METHODS

The literature review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The researcher performed a structured literature search to identify studies that reported mental health issues among healthcare workers during the COVID-19 pandemic in the following databases in English: PubMed, Cochrane Library, Scopus, Google Scholar, Center for Diseases

Control, World Health Organization (WHO), and local databases like the Philippine National Institute of Health.

### **Inclusion criteria**

The researcher included any study about healthcare workers during the covid-19 pandemic, with outcomes relating to their mental health. There were no restrictions related to the study design or research locale. They included primary studies, written in English, related to COVID-19 and the mental health of healthcare workers, mental health or mental well-being, or psychological outcomes.

The exclusion criteria were duplicated articles, publication outside the period between March and October 2020, no access to the full article, and no prevalence or absence of mental health issues among healthcare personnel. However, the researcher excluded reviews, theses, position papers, protocol papers, and studies not published in English.

### **Literature search and article selection**

The search covered all types of articles published in March 2020–October 2020 like reviews, commentary, correspondence, letters to the editor, original research articles, full papers, abstracts, interim reports, official documents, and published and unpublished studies that are relevant to the subject of the review. Also included were studies that evaluated the presence of depression, stress, and anxiety among healthcare workers during this pandemic and reports of videoconferences.

In retrieving the studies, the following terms used in the search were COVID-19 or COVID-19-2019 or COVID-192019 or coronavirus disease 2019 or SARS-CoV-2 or SARS2 or 2019 novel coronavirus infection or coronavirus disease-19 or novel coronavirus or SARS-CoV-2019 or sars-COVID-19 or sars-COVID-192019 or sars-COVID-19 2019 or Wuhan virus or coronavirus, or psychological, or stress, or depression, or anxiety, or mental health, or psychiatric issues, and COVID-19, corona, SARS, SARS-CoV, MERS, MERS-CoV, Middle East respiratory syndrome, novel coronavirus, and HCW, or doctors, or medical staff, or health care professionals, or health care workers, or frontliners, or medical frontliners.

Data extracted included results in a structured table: author/s, publication date, sample and study location, study design, main findings, mental health issues, and the number of references.

### **Data extraction, quality assessment and presentation**

An associate researcher assisted the author in conducting the literature search. Private discussions via Zoom reconciled the screening process results, brainstorming, and resolving differences in views.

The JBI (Joanna Briggs Institute) Quality Assessment tool was used to assess the quality of the included studies. Recruitment for most of the studies occurred shortly after WHO announced COVID-19 as a Public Health Emergency of International Concern and for only seven months, through October 2020.

The studies used online questionnaires and selected populations with access to the internet, which might have affected their samples' representativeness. Some selection bias may have been present. Health workers without internet access, older healthcare workers, and those who might have been busy with their work duties might have opted not to participate and could not share the pandemic's impact on their mental health. The results were mainly self-reported and taken from subjected scales so there could be respondent bias.

## RESULTS

### Search results

The initial search resulted in 431 records of interest. There were 149 duplicates excluded, and 35 potentially relevant studies were eligible for assessment. Twenty-one (21) published studies met the inclusion criteria for the review. Five of the studies were from China, the rest were from Egypt (1), Italy (2), KSA (2), Nepal (1), Oman (2), Pakistan (1), Philippines (1), Poland (1), Singapore (1), Spain (1), Turkey (2), and Global (1) covering 31 countries from the Western Pacific Region and Eastern Mediterranean. Several validated tools assessed anxiety, depression, insomnia, stress, post-traumatic stress (PTS), and burnout.

The twenty-one (21) studies focused on the psychological impact of the COVID-19 crisis. Results show the psychological impact of COVID-19 on healthcare workers by geographic location.

### 1. Asia (China, Nepal, Pakistan, Philippines, Singapore)

A significant proportion of those who participated in the Lai et al. (2020) study in China admitted having anxiety, depression, and insomnia symptoms, and more than 70% reported psychological distress. Lu et al. (2020) disclosed that the medical front-liners were twice more likely to suffer anxiety and depression than those having close contact with infected patients. Que et al. (2020) reported that, in general, healthcare workers reported anxiety, depression, or insomnia, with the nurses observed to have the highest prevalence of anxiety symptoms (51.44%); the public health professionals (48.80%) and medical residents (40.53%) revealed depressive symptoms. In Zhang et al. (2020) study, medical health workers had higher prevalence rates of severe insomnia, anxiety, depression, somatization, and obsessive-compulsive symptoms than nonmedical health workers. Post-traumatic stress (PTS) symptoms were prevalent in this sample of Chinese healthcare professionals (Si et al., 2020), and 40.2% had significant post-traumatic stress disorder symptoms.

Of a total of 475 Nepali health workers (Khanal et al., 2020), 41.9% had anxiety, while some showed symptoms of depression (37.5%) and insomnia (33.9%). In the study by Sandesh et al. (2020), around 89% of healthcare workers feared for their families, and 80% feared being infected. Labrague et al. (2020) reported that of the 325 Filipino nurses who participated in their survey, 123 (37.8%) revealed dysfunctional anxiety levels. In Singapore, Tan et al. (2020) study revealed the prevalence of depression, stress, anxiety, and post-traumatic stress disorder (PTSD) among healthcare workers.

### 2. Middle East (Oman, Saudi Arabia, Turkey)

In Oman, the study of Alshekaili et al. (2020) and Badahdah et al. (2020) appeared to conform with other studies suggesting that the COVID-19 pandemic has resulted in a higher rate of depressive symptoms, anxiety, and insomnia. Of the healthcare workers in Saudi Arabia (Al-Hanawi, 2020), evidence showed that 40% of the Saudi sample are distressed due to COVID-19, approximately 33% are mildly distressed, and 7% are severely distressed. The Tamsah et al. (2020) study showed Saudi staff feeling more anxious about family members contracting the virus than getting infected. In Turkey, Sahin et al. (2020) reported that female healthcare workers exhibit higher depression, anxiety, insomnia, and distress symptoms. Those with a history of psychiatric ailment and receiving psychiatric support revealed depression, anxiety, insomnia, and distress symptoms.

### 3. Europe (Italy, Poland, Spain)

European healthcare workers reported high depressive and post-traumatic stress symptoms (PTSS), anxiety and depressive symptoms, burnout, or psychological conditions.

In Piedmont, Italy, Di Tella et al. (2020) presented that healthcare professionals involved in COVID-19 management have high depressive and post-traumatic stress symptoms (PTSS). Giusti et al. (2020) reported two hundred thirty-five health professionals (71.2%) with state anxiety scores above the clinical cutoff.

In Spain, tertiary hospital workers and those working in ambulance services had a higher stress level (Romero et al., 2020). In the study of Szylińska et al. (2020), participants who had direct contact with COVID-infected patients in the emergency and infectious wards and ICUs were more vulnerable to showing anxiety and depressive symptoms. A significant proportion of these 441 healthcare workers in the Western Pomerania region in Poland had bouts of anxiety, depression, and insomnia. Over 90% of these symptoms were prevalent among those who had direct exposure to persons infected or suspected of having COVID-19.

### 4. Africa (Egypt)

In Egypt, many healthcare workers dealing with COVID-19 in 20 hospitals admitted to having anxiety, depression, insomnia, and stress symptoms (Elkholy et al., 2020).

### 5. Global

With 2097 participants from 31 countries worldwide, the study (Htay et al., 2020) provide evidence of a high prevalence of anxiety (60%) and depression symptoms (53%) among healthcare workers covering the Eastern Mediterranean Region (EMRO) and the Western Pacific Region.

## DISCUSSION

This systematic review identified studies about healthcare workers' mental health during the covid-19 pandemic. The incidence of stress, regardless of culture and background, was higher in situations involving healthcare workers on the front lines. The main risk factors and conditions that worsen or trigger mental health issues include age, direct contact with infected patients, not being knowledgeable enough about COVID-19, prolonged work hours, and limited PPEs and supplies. In general, hospital safety and preparedness, reliable and updated education on the disease's transmission and prevention, adequate PPEs and supplies, and self-care activities may work positively to curtail "coronophobia" and other adverse psychological reactions among healthcare workers. The crucial and massive front liner role of healthcare workers during pandemics makes them anxious and stressed out due to a long list of factors (Lai et al., 2020; Si et al., 2020; Zhang et al., 2020; Sandesh et al., 2020; Badhadha et al., 2020; Temsah, 2020; Al-Hanawi et al., 2020; Di Tella et al., 2020; Giusti et al., 2020). The working conditions during pandemics adversely affect healthcare workers' mental health. The workload and work-related pressure vis-à-vis the rising cases may have contributed to the mental health concerns reported in the studies. Exposure to patients with covid-19, a lack of personal protective equipment, and subsequent fear of getting infected or infecting colleagues and loved ones contribute to the healthcare workers' distress.

More interventions towards improving the knowledge and skills of HCWs, as well as reassuring them of the efficiency of proper infection prevention and control measures, and providing a safe environment, are needed (Temsah, M. H, 2020). The high degree of stress came out since COVID-19 is a

newly emerging virus with uncertain contagiousness, high transmission rate, and degree of information associated with it (Temsah, M. H, 2020). During the H1N1 Influenza pandemic, stress and anxiety were also observed. Healthcare workers reported significant concerns about acquiring COVID-19 and transmitting it to a family member. This finding is expected and reproduced from previous similar studies (Temsah, M. H, 2020).

The studies in this review reported that isolation and high-risk workplaces and contact with infected people caused much stress and trauma—the fact of human-to-human transmission and the presence of infected but asymptomatic persons triggered anxiety and fear among healthcare workers. Similarly found, in the study of Maunder et al. (2004), distress in response to the severe acute respiratory syndrome outbreak is more significant in nurses and those who care for patients with severe acute respiratory syndrome. Even years after epidemics, healthcare workers on the frontline still experienced psychological distress. The Ebola and SARS outbreaks disclosed these outcomes (Khalid et al., 2016).

### **Strengths and limitations**

This paper is a systematic review that shows this study's strength, and the studies were conducted in Asia and other continents. This review provides an essential reference for future studies on healthcare workers worldwide. Search strategies designed to retrieve publications focusing on healthcare workers' mental health during the COVID-19 pandemic limited the review; no studies were exclusively about the physical protection, infection, and transmission rates in populations retrieved.

Moreover, this review lacks a longitudinal analysis of data. The review is focused on the impact on the healthcare workers' mental health in general and does not compare the symptoms according to the types of healthcare workers. Most papers utilized non-probability sampling methods and the number of respondents seems incomparable, and sample procedures must confirm representativeness to the general population. It relied on convenience samples and may not, therefore, be representative of all healthcare workers.

### **CONCLUSION AND RECOMMENDATIONS**

The studies included in this review focused on hospital settings which is a big concern since, in reality, deaths happen in the community and even in nursing and care homes. Therefore, future studies may tap into other workplaces that deployed other healthcare workers, suggesting that different contexts and cultures may reveal different findings.

Several risk factors emerged in the review of the studies. Those with the most substantial evidence were inadequate PPE, fear of infection, and heavy workload. Some studies suggest that being younger or female may be a risk factor. Another observation is that many of the studies measured adverse mental health outcomes. Future studies may also focus on our healthcare workers' protective factors or coping mechanisms. We must welcome research that evaluates the direct psychological consequences and indirect effects on mental health to improve treatment, health care planning, and preventive measures during potential subsequent pandemics.

Lastly, supporting and protecting healthcare workers' mental health is morally justified. If done well, this should reduce the risk of mental health issues and provide optimum opportunity for staff to experience psychological growth from overcoming the formidable challenges during this trying time. Much could be done to support and protect healthcare workers' physical and mental health as they willingly put themselves in the line of fire to protect and save other people's lives.

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APPENDIX

Table 1. PRISMA

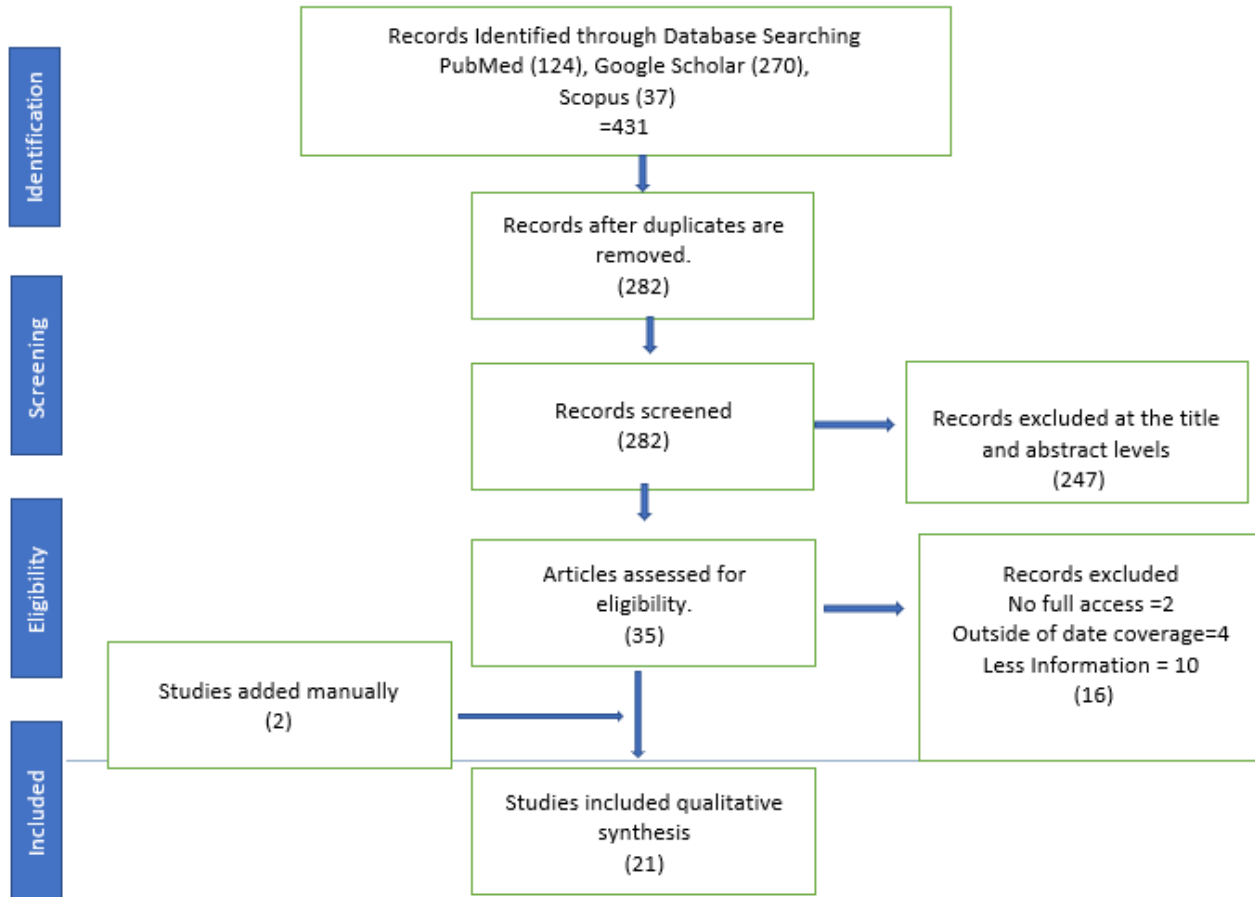


Table 2. Quality assessment of 21 studies including the Joanna Briggs Institute quality assessment tool

	1	2	3	4	5	6
1. Were the criteria for inclusion in the sample clearly defined?	YES	YES	YES	YES	YES	YES
2. Were the study subjects and the setting described in detail?	YES	YES	YES	YES	YES	YES
3. Was the exposure measured in a valid and reliable way?	YES	YES	YES	YES	YES	UC
4. Were objective, standard criteria used for measurement of the condition?	YES	YES	YES	YES	YES	UC
5. Were confounding factors identified?	YES	YES	YES	NA	YES	YES
6. Were strategies to deal with confounding factors stated?	YES	YES	UC	NA	UC	UC
7. Were the outcomes measured in a valid and reliable way?	YES	YES	YES	YES	YES	UC
8. Was appropriate statistical analysis used?	YES	YES	YES	YES	YES	YES

**JBI Critical appraisal checklist for analytical cross-sectional studies**

Yes / No / Unclear (UC) / Not applicable (NA)

	7	8	9	10	11	12
1. Were the criteria for inclusion in the sample clearly defined?	NO	YES	YES	YES	YES	YES
2. Were the study subjects and the setting described in detail?	YES	YES	YES	YES	YES	YES
3. Was the exposure measured in a valid and reliable way?	YES	YES	YES	YES	YES	YES
4. Were objective, standard criteria used for measurement of the condition?	YES	YES	YES	YES	YES	YES
5. Were confounding factors identified?	YES	YES	YES	YES	YES	YES
6. Were strategies to deal with confounding factors stated?	YES	UC	UC	YES	YES	YES
7. Were the outcomes measured in a valid and reliable way?	YES	YES	YES	YES	YES	YES
8. Was appropriate statistical analysis used?	YES	YES	YES	YES	YES	YES

	13	14	15	16	17	18
1. Were the criteria for inclusion in the sample clearly defined?	NO	YES	YES	YES	YES	YES
2. Were the study subjects and the setting described in detail?	NO	YES	YES	YES	YES	YES
3. Was the exposure measured in a valid and reliable way?	YES	YES	YES	YES	YES	YES
4. Were objective, standard criteria used for measurement of the condition?	YES	YES	YES	YES	YES	YES
5. Were confounding factors identified?	YES	YES	YES	YES	YES	YES
6. Were strategies to deal with confounding factors stated?	YES	YES	YES	YES	YES	YES
7. Were the outcomes measured in a valid and reliable way?	YES	YES	YES	YES	YES	YES
8. Was appropriate statistical analysis used?	YES	YES	YES	YES	YES	YES

	19	20	21
1. Were the criteria for inclusion in the sample clearly defined?	NO	YES	YES
2. Were the study subjects and the setting described in detail?	YES	YES	NO

3. Was the exposure measured in a valid and reliable way?	YES	YES	YES
4. Were objective, standard criteria used for measurement of the condition?	YES	YES	YES
5. Were confounding factors identified?	YES	YES	YES
6. Were strategies to deal with confounding factors stated?	YES	UC	UC
7. Were the outcomes measured in a valid and reliable way?	YES	YES	YES
8. Was appropriate statistical analysis used?	YES	YES	YES

Table 3. Overview of studies included in the review

Authors	Year Published	Sample/Place conducted	Study Design	Instruments	Main Findings	Mental Health Issues	No. of References
Di Tella, M., Romeo, A., Benfante, A., & Castelli, L. (2020). Mental health of healthcare workers during the COVID-19 pandemic in Italy. <i>Journal of evaluation in clinical practice</i> , 26(6), 1583-1587. (1)	25 July 2020	145 healthcare workers (72 medical doctors and 73 nurses)/ March 19 to April 5, 2020/ Piedmont	online survey <b>cross sectional study</b>	(a) quality of life and health-related Visual Analogue Scales, (b) State-Trait Anxiety Inventory-Form Y1, (c) Beck Depression Inventory, and (d) PTSD Checklist for DSM-5.	The present results showed that healthcare professionals who work in COVID-19 wards reported higher levels of depressive symptoms and PTSS than those who work in other healthcare units.	Depressive symptoms posttraumatic stress symptoms (PTSS).	<b>12</b>

<p>Sandesh, R., Shahid, W., Dev, K., Mandhan, N., Shankar, P., Shaikh, A., &amp; Rizwan, A. (2020). Impact of COVID-19 on the mental health of healthcare professionals in Pakistan. <i>Cureus, 12</i> (7). (2)</p>	<p>2020 Jul 2</p>	<p>64 (57.1%) were male, and 48 (42.9%) were female/ May 2020, at various hospitals of Karachi, Pakistan</p>	<p>cross-sectional study</p>	<p>Depression Anxiety Stress Scale-21 (DASS-21)</p>	<p>The overall mean score of anxiety was 19.01 ± 9.2, depression was 18.12 ± 10, and stress was 20.12 ± 12.0. There were 81 (72.3%) participants who suffered from moderate to extremely severe depression, 96 (85.7%) participants who suffered from moderate to extremely severe anxiety, and 101 (90.1%) participants who reported moderate to extreme stress levels</p>	<p>anxiety, stress, and depression .</p>	<p>14</p>
<p>Tan, B. Y., Chew, N. W., Lee, G. K., Jing, M., Goh, Y., Yeo, L. L., ... &amp; Sharma, V. K.</p>	<p>2020</p>	<p>470 (94%) participated in the study From 19 February to 13 March 2020, health care</p>	<p>Study - questionnaire</p>	<p>Depression, Anxiety, and Stress Scales (DASS-21) and the Impact of Events Scale-Revised (IES-R) instrument</p>	<p>nonmedical health care personnel are at highest risk for psychological distress during the COVID-19 outbreak.</p>	<p>Anxiety, depression, stress</p>	<p>Full - no access</p>

<p>(2020). Psychological impact of the COVID-19 pandemic on health care workers in Singapore. <i>Annals of internal medicine</i>, 173(4), 317-320.</p> <p>(3)</p>		<p>workers from 2 major tertiary institutions in Singapore</p>			<p>Sixty-eight (14.5%) participants screened positive for anxiety, 42 (8.9%) for depression, 31 (6.6%) for stress, and 36 (7.7%) for clinical concern of PTSD. The prevalence of anxiety was higher among nonmedical health care workers than medical personnel (20.7% versus 10.8%; adjusted prevalence ratio, 1.85 [95% CI, 1.15 to 2.99]; <math>P = 0.011</math>), after adjustment for age, sex, ethnicity, marital status, survey completion date, and presence of comorbid conditions. Similarly, higher mean</p>		
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					DASS-21 anxiety and stress subscale scores and higher IES-R total and subscale scores were observed in nonmedical health care workers		
Que, J., Le Shi, J. D., Liu, J., Zhang, L., Wu, S., Gong, Y., ... & Lu, L. (2020). Psychological impact of the COVID-19 pandemic on healthcare workers: a cross-sectional study in China. <i>General psychiatry</i> , 33(3).  (4)	Published online 2020 Jun 14	Feb 2020 2285 healthcare workers from 28 province-level regions in China completed the questionnaire, of whom 707 (30.94%) were men and 1578 (69.06%) were women, with an average age of 31.06 years (SD=6.99 years). The participant	a cross-sectional study	social media platform-based (WeChat) survey program Questionnaire Star in February 2020 in China  Chinese version of the Seven-Item Generalized Anxiety Disorder Scale (GAD-7)	a greater risk of psychological problems may be associated with receiving negative information about the pandemic. Participation in front-line work appears to be an important risk factor for anxiety, insomnia and overall psychological problems.	symptoms of anxiety, depression, insomnia and the overall psychological problems	49

		s included medical residents (913; 39.96%), physicians (860; 37.64%), nurses (208; 9.10%), technicians (179; 7.83%) and public health practitioners (125; 5.47%).					
Temsah, M. H., Al-Sohime, F., Alamro, N., Al-Eyadhy, A., Al-Hasan, K., Jamal, A., ... & Somily, A. M. (2020). The psychological impact of COVID-19 pandemic on health care workers in	June 2020	A total of 582 out of 811 health care workers (HCWs) completed the survey questionnaire (response rate of 71.8%). Of those, 437 (75%) were female, with nurses representing 62.4% (n = 363)	<b>Electronic survey</b>	pilot-validated self-reported questionnaire	This study emphasizes the impact of risk of exposure of HCWs to emerging infectious diseases on their mental health, subsequently its effect on their personal and social lives, and its effect on patients' care.	Majority of HCWs enrolled in the survey had mild anxiety (397 (68.25%) according to Generalized Anxiety Disorder (GAD-7) scale, followed by moderate anxiety 121(20.8%), while few had high	<b>43</b>



<p>a MERS-CoV endemic country. <i>Journal of Infection and Public Health</i>, 13(6), 877-882.</p> <p>(5)</p>		<p>February 5th and 16th, 2020, at the King Khalid University Hospital (KKUH), Riyadh, Saudi Arabia</p>				<p>moderate 47 (8.1%) and the least had very high anxiety 17 (2.9%)</p>	
<p>Romero, C. S., Delgado, C., Catalá, J., Ferrer, C., Errando, C., Iftimi, A., ... &amp; Otero, M. (2020). COVID-19 psychological impact in 3109 healthcare workers in Spain: The PSIMCO V group. <i>Psychological medicine</i>, 1-7.</p> <p>(6)</p>	<p>14 May 2020</p>	<p>3109 healthcare workers completed a national, internet-based, cross-sectional 45-item survey between 9 and 19 April 2020.</p> <p>Spanish healthcare workers.</p>	<p><b>Scross-sectional Survey</b></p>	<p>A Psychological Stress and Adaptation at work Score (PSAS) was defined combining four modified versions of validated psychological assessment tests (A) <i>Healthcare Stressful Test</i>, (B) <i>Coping Strategies Inventory</i>, (C) <i>Font-Roja Questionnaire</i> and (D) <i>Trait Meta-Mood Scale</i>.</p>	<p>The highest psychosocial impact was perceived in Respiratory Medicine, the mean (S.D.) PSAS was 48.3 (13.6) and Geriatrics 47.6 (16.4). Higher distress levels were found in the geographical areas with the highest incidence of COVID-19 (&gt;245.5 cases per 100 000 people), PSAS 46.8 (15.2); <math>p &lt; 0.001</math>. The least stress respondents were</p>	<p><b>distress</b></p>	<p><b>17</b></p>

					<p>asymptomatic workers PSAS, 41.3 (15.4); <math>p &lt; 0.001</math>, as well as those above 60 years old, PSAS, 37.6 (16); <math>p &lt; 0.001</math>. Workers who needed psychological therapy and did not receive it, were more stressed PSAS 52.5 (13.6) than those who did not need it PSAS 39.7 (13.9); <math>p &lt; 0.001</math>.</p>		
Giusti, E. M., Pedroli, E., D'Aniello, G. E., Badiale, C. S., Pietrabissa, G., Manna, C., ... & Molinari, E. (2020). The psychological	2020 Jul 10	Three hundred and thirty health professionals participated to the online survey. Health professionals working in the hospitals	Cross-Sectional Study	State Anxiety: State-Trait Anxiety Inventory—State form (STAI-S) Psychological distress: Depression, Anxiety and Stress Scale-21 (DASS) Post-traumatic symptoms:	two hundred and thirty-five health professionals (71.2%) had scores of state anxiety above the clinical cutoff, 88 (26.8%) had clinical levels of depression, 103 (31.3%) of anxiety, 113 (34.3%) of stress, 121	<b>Anxiety Depression Ptsd Emotional exhaustion Depersonalization Reduced personal achievement</b>	<b>53</b>

<p>cal impact of the COVID-19 outbreak on health professionals: a cross-sectional study. <i>Frontiers in Psychology</i>, 11.</p> <p>(7)</p>		<p>of the Istituto Auxologico Italiano</p>		<p>Impact of Event Scale—Revised—6 items version (IES-6) Burnout: Maslach Burnout Inventory (MBI) (Maslach et al., <a href="#">1997</a>).</p>	<p>(36.7%) of post-traumatic stress. Regarding burnout, 107 (35.7%) had moderate and 105 (31.9%) severe levels of emotional exhaustion; 46 (14.0%) had moderate and 40 (12.1%) severe levels of depersonalization; 132 (40.1%) had moderate and 113 (34.3%) severe levels of reduced personal accomplishment.</p>		
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<p>Zhang, W. R., Wang, K., Yin, L., Zhao, W. F., Xue, Q., Peng, M., ... &amp; Wang, H. X. (2020). Mental health and psychosocial problems of medical health workers during the COVID-19 epidemic in China. <i>Psychotherapy and psychosomatics</i>, 89(4), 242-250.</p> <p>(8)</p>	<p>2020 Apr 9</p>	<p>a total of 2,182 participants from China</p>	<p>cross-sectional study performed via an online survey run from February 19 to March 6, 2020.</p>	<p>Insomnia Severity Index (ISI) Patient Health Questionnaire-4 (PHQ-4) Symptom Check List-90-revised (SCL-90-R)</p>	<p>Medical health workers showed higher prevalence rates of insomnia (38.4 vs. 30.5%, <math>p &lt; 0.01</math>), anxiety (13.0 vs. 8.5%, <math>p &lt; 0.01</math>), depression (12.2 vs. 9.5%; <math>p = 0.04</math>), somatization (1.6 vs. 0.4%; <math>p &lt; 0.01</math>), and obsessive-compulsive symptoms (5.3 vs. 2.2%; <math>p &lt; 0.01</math>) than nonmedical health workers. Medical health workers also had higher total scores of ISI (<math>p &lt; 0.01</math>), GAD-2 (<math>p &lt; 0.01</math>), PHQ-2 (<math>p = 0.01</math>), and on the SCL-90-R obsessive-</p>	<p>severe insomnia, anxiety, depression, somatization, and obsessive-compulsive symptoms.</p>	<p>34</p>
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					<p>compulsive symptom scale (<math>p &lt; 0.01</math>) than nonmedical health workers. Each item of ISI (<math>p &lt; 0.01</math> or <math>p &lt; 0.05</math>), GAD-2 (<math>p &lt; 0.01</math>), and PHQ-2 (<math>p = 0.01</math>) was significantly elevated in medical health workers compared with nonmedical health workers. On the SCL-90-R obsessive-compulsive symptom scale, 6 of the 10 items had higher scores in medical health workers than in nonmedical health workers. In the SCL-90-R somatization symptoms scale, 3 of 12 items,</p>	
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					including questions 1 (headaches) ( $p = 0.01$ ), 4 (faintness or dizziness) ( $p < 0.01$ ), and 48 (trouble getting your breath) ( $p < 0.01$ ), had higher scores in medical health workers than in nonmedical health workers.		
Khanal, P., Devkota, N., Dahal, M., Paudel, K., & Joshi, D. (2020). Mental health impacts among health workers during COVID-19 in a low resource setting: a cross-sectional survey	25 September 2020	. A total of 475 health workers cross-sectional study was conducted via web online survey among health workers working in health facilities in Nepal. Data were collected from April	cross-sectional web-based survey conducted between April 26 and May 12, 2020	Anxiety and depression were measured using a 14-item Hospital Anxiety and Depression Scale (HADS: 0–21) and insomnia was measured by using a 7-item Insomnia Severity Index (ISI: 0–28).	Overall, 41.9% of health workers had symptoms of anxiety, 37.5% had depression symptoms and 33.9% had symptoms of insomnia.	anxiety, depression and insomnia symptoms	<b>49</b>

from Nepal. <i>Globalization and health</i> , 16(1), 1-12.  (9)		26 to May 122,020.					
Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, Wu J, Du H, Chen T, Li R. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019..  (10)	2020 Mar 2;	1257 health care workers in 34 hospitals from January 29, 2020, to February 3, 2020, in China.	cross-sectional, survey-based, region-stratified study	Chinese versions of the 9-item Patient Health Questionnaire, the 7-item Generalized Anxiety Disorder scale, the 7-item Insomnia Severity Index, and the 22-item Impact of Event Scale-Revised,	A considerable proportion of participants reported symptoms of depression (634 [50.4%]), anxiety (560 [44.6%]), insomnia (427 [34.0%]), and distress (899 [71.5%]). Nurses, women, frontline health care workers, and those working in Wuhan, China, reported more severe degrees of all measurements of mental health symptoms than other health care	psychological burden	<b>22</b>

					<p>workers (eg, median [IQR] Patient Health Questionnaire scores among physicians vs nurses: 4.0 [1.0-7.0] vs 5.0 [2.0-8.0]; P = .007; median [interquartile range {IQR}] Generalized Anxiety Disorder scale scores among men vs women: 2.0 [0-6.0] vs 4.0 [1.0-7.0]; P &lt; .001; median [IQR] Insomnia Severity Index scores among frontline vs second-line workers: 6.0 [2.0-11.0] vs 4.0 [1.0-8.0]; P &lt; .001; median [IQR] Impact of Event Scale-Revised scores among those in Wuhan vs those in</p>		
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					<p>Hubei outside Wuhan and those outside Hubei: 21.0 [8.5-34.5] vs 18.0 [6.0-28.0] in Hubei outside Wuhan and 15.0 [4.0-26.0] outside Hubei; P &lt; .001). Multivariable logistic regression analysis showed participants from outside Hubei province were associated with lower risk of experiencing symptoms of distress compared with those in Wuhan (odds ratio [OR], 0.62; 95% CI, 0.43-0.88; P = .008). Frontline health care workers engaged in direct diagnosis, treatment,</p>	
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					and care of patients with COVID-19 were associated with a higher risk of symptoms of depression (OR, 1.52; 95% CI, 1.11-2.09; P = .01), anxiety (OR, 1.57; 95% CI, 1.22-2.02; P < .001), insomnia (OR, 2.97; 95% CI, 1.92-4.60; P < .001), and distress (OR, 1.60; 95% CI, 1.25-2.04; P < .001).		
Wańkowitz, P., Szylińska, A., & Rotter, I. (2020). Assessment of mental health factors among health professionals depending on their	<b>12 August 2020</b>	Western Pomerania region in Poland from 3 May 2020 to 17 May 2020.  441 healthcare workers	cross-sectional, hospital-based study	the Generalized Anxiety Disorder scale (GAD-7; range 0–21) [18] to assess the severity of the symptoms of anxiety, the 9-item Patient Health Questionnaire (PHQ; range 0–27) [19,20,21,22,	a significant proportion of participants experienced symptoms of anxiety, depression, and insomnia, with over 90% prevalence of these symptoms in the group of employees having direct contact with	symptoms of anxiety, depression and sleep disorders	<b>39</b>

<p>contact with COVID-19 patients. <i>International Journal of Environmental Research and Public Health</i>, 17 (16), 5849.</p> <p><b>(11)</b></p>				<p><a href="#">23,24]</a> to assess the severity of depression symptoms, and the 7-item Insomnia Severity Index (ISI; range 0–28) to assess the severity of sleep disorders</p>	<p>persons suspected or infected with SARS-CoV-2 healthcare workers not directly involved in the diagnosis or therapy of patients infected with SARS-CoV-2, the group of frontline workers more often presented symptoms of anxiety, depression, and sleep disorders (<math>p &lt; 0.001</math>, <math>p &lt; 0.001</math>, <math>p &lt; 0.001</math>, respectively).</p>		
<p>Alshekaili, M., Hassan, W., Al Said, N., Al Sulaimani, F., Jayapal, S. K., Al-Mawali, A., ... &amp; Al-Adawi,</p>	<p>October 10, 2020</p>	<p>The study accrued 1139 participants of which 574 were working as frontline healthcare workers (HCWs) (565 non-frontline</p>	<p>cross-sectional study was conducted from 8 April 2020 to 17 April 2020</p>	<p>The depression, Anxiety and Stress Scale (DASS-21) and Insomnia Severity Index (ISI).</p>	<p>A total of 368 (32.3%), 388 (34.1%), 271 (23.8%) and 211 (18.5%) respondents were reported to have depression, anxiety, stress and insomnia, respectively.</p>	<p>sleep–wake cycles and anxiety symptoms</p>	<p><b>44</b></p>

<p>S. (2020). Factors associated with mental health outcomes across healthcare settings in Oman during COVID-19: frontline versus non-frontline healthcare workers. <i>B MJ open</i>, 10(10), e042030.</p> <p>(12)</p>		<p>workers) serving patients with COVID-19 in different categories of healthcare settings in Oman</p>			<p>HCWs in the frontline group were 1.5 times more likely to report anxiety (OR=1.557, p=0.004), stress (OR=1.506, p=0.016) and insomnia (OR=1.586, p=0.013) as compared with those in the non-frontline group. No significant differences in depression status were found between the frontline and non-frontline groups (p=0.201).</p>		
<p>Al-Hanawi, M. K., Mwale, M. L., Alshareef, N., Qattan, A. M., Angawi, K., Almubark, R., &amp; Alsharqi,</p>	<p>2020 Jul 7</p>	<p>Saudi Arabia from 3 May to 8 May 2020, using a validated self-reported survey. 950 (31.35%)</p>	<p>cross-sectional study,</p>	<p>The survey used the COVID-19 Peritraumatic Distress Index (CPDI) self-reported questionnaire online self-reported questionnaire . The psychological</p>	<p>Amongst health workers, the proportion of respondents as a percentage of the total sample increased as we moved from normal (28.9%),</p>	<p>In the medium term, there is a need to improve monitoring and reporting of anxiety rates, depression and self-harm,</p>	<p>37</p>

<p>O. (2020). Psychological distress amongst health workers and the general public during the COVID-19 pandemic in Saudi Arabia. <i>Risk management and healthcare policy</i>, 13, 733.</p> <p>(13)</p>		<p>health workers, of which 449 (14.8%) were frontline health workers, with the remaining 2086 (68.7%) being the general public,</p>		<p>distress was constructed using the COVID-19 Peritraumatic Distress Index</p>	<p>through mild (33.7%), to severe (39.9%) distress. The result is statistically significant (<math>p &lt; 0.01</math>), which provides preliminary evidence that health workers are at greater risk of psychological distress relative to non-health workers. A similar statistically significant trend is observed for frontline health workers, with the percentage growing from normal (13.4%), through mild (15.5%), to severe (24.3%) distress.</p>	<p>especially amongst the highly affected groups such as healthcare workers and the younger population .</p>	
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<p>Elkholy, H., Tawfik, F., Ibrahim, I., Salah El-din, W., Sabry, M., Mohammed, S., ... &amp; Omar, A. N. (2020). Mental health of frontline healthcare workers exposed to COVID-19 in Egypt: a call for action. <i>International Journal of Social Psychiatry</i>, 00207640-20960192.</p> <p><b>(14)</b></p>	<p>September 24, 2020</p>	<p>cross-sectional, hospital-based survey study</p>	<p>502 HCW dealing with COVID-19. HCW were surveyed in 20 hospitals (Fever, Chest, and Quarantine hospitals) in different parts of Egypt, in April and May 2020.</p>	<p>Patient Health Questionnaire (PHQ) The 7-item Generalized Anxiety Disorder (GAD-7) 7-item Insomnia Severity Index (ISI) Perceived Stress Scale (PSS)</p>	<p>A considerable proportion of HCW had symptoms of anxiety, insomnia, depression, and stress. Females were at higher risk of experiencing symptoms of severe anxiety (odds ratio [OR], 1.85; 95% CI, 1.12–3.05; <math>p = .016</math>), severe depression (OR, 2.013; 95% CI, 1.17–3.4; <math>p = .011</math>), and severe stress (OR, 2.68; 95% CI, 1.5–4.6; <math>p &lt; .001</math>). Fever hospital workers were at higher risk of severe depression (OR, 1.52; 95% CI, 1.11–2.09; <math>p &lt; .01</math>), compared to</p>	<p>Overall, 77.3%, 69.5%, 79.3%, and 83.1% of all participants reported symptoms of anxiety, Insomnia, depression, and stress, respectively.</p>	<p><b>38</b></p>
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					Quarantine hospital workers.		
Htay, M. N. N., Marzo, R. R., AlRifai, A., Kamberi, F., El-Abasiri, R. A., Nyamache, J. M., ... & Abas, A. L. (2020). Immediate impact of COVID-19 on mental health and its associated factors among healthcare workers: a global perspective across 31 countries. <i>Journal of Global Health, 10</i> (2). (15)	2020 Aug 23.	2097 participants from 31 countries worldwide Eastern Mediterranean Region (EMRO) (52.0%), and a quarter was from the Western Pacific Region (WPRO) (25.4%)	Cross sectional Web-based survey	web-based questionnaire . Generalized Anxiety Disorder (GAD-7) scale [8], and the Patient Health Questionnaire (PHQ-9)	The data presented in this study provide evidence of a high prevalence of anxiety (60%) and depression symptoms (53%) among the healthcare workers across the regions.	anxiety and depression symptoms	<b>15</b>

<p>Labrague, L. J., &amp; De los Santos, J. A. A. (2020). COVID-19 anxiety among front-line nurses: Predictive role of organisational support, personal resilience and social support. <i>Journal of nursing management</i>, 28(7), 1653-1661.</p> <p>(16)</p>	<p><b>03 Aug 2020</b></p>	<p>325 nurses responded Philippines, Region 8, 25 April to 25 May 2020.</p>	<p>cross-sectional study</p>	<p>Four standardized, self-reported scales were used for data collection: the COVID-19 Anxiety Scale, the Brief Resilient Coping Scale (BRCS), the Perceived Social Support Questionnaire (PSSQ) and the Perceived Organizational Support (POS) questionnaire .</p>	<p>Of the 325 nurses in the study, 123 (37.8%) were found to have dysfunctional levels of anxiety. Using multiple linear regression analyses, social support (<math>\beta = -0.142</math>, <math>p = .011</math>), personal resilience (<math>\beta = -0.151</math>, <math>p = .008</math>) and organisational support (<math>\beta = -0.127</math>, <math>p = .023</math>) predicted COVID-19 anxiety. Nurse characteristics were not associated with COVID-19 anxiety.</p>	<p>tonic immobility' and 'sleep disturbance'</p>	<p><b>61</b></p>
<p>Lu, W., Wang, H., Lin, Y., &amp; Li, L. (2020). Psychological status of medical workforce</p>	<p>June 2020</p>	<p>2299 eligible participants were enrolled from the authors' institution, including</p>	<p>single-center, cross-sectional survey via online questionnaires.</p>	<p>numeric rating scale (NRS) on fear, Hamilton Anxiety Scale (HAMA), and Hamilton Depression</p>	<p>front line medical staff with close contact with infected patients, including working in the</p>	<p><b>Fear, anxiety, depression</b></p>	<p><b>Full - no access</b></p>



<p>during the COVID-19 pandemic: A cross-sectional study. <i>Psychiatry research</i>, 288, 112936.</p> <p>(17)</p>		<p>2042 medical staff and 257 administrative staff.</p>		<p>Scale (HAMD)</p>	<p>departments of respiratory, emergency, infectious disease, and ICU, showed higher scores on fear scale, HAMA and HAMD, and they were 1.4 times more likely to feel fear, twice more likely to suffer anxiety and depression. The medical staff especially working in above-mentioned departments made them more susceptible to psychological disorders.</p>		
<p>Şahin, M. K., Aker, S., Şahin, G., &amp; Karabekir oğlu, A. (2020). Prevalence of depression, anxiety,</p>	<p><b>11 September 2020</b></p>	<p>580 (61.8%) were physicians, 569 (60.6%) were working on the front line.</p>	<p>study survey online to HCWs during the pandemic in Turkey between 23 April and 23 May 2020</p>	<p>sociodemographic data form, Patient Health Questionnaire-9, General Anxiety Disorder-7, Insomnia Severity Index, and</p>	<p>Seven hundred twenty-nine (77.6%) exhibited symptoms of depression, 565 (60.2%) anxiety symptoms, 473 (50.4%)</p>	<p>HCWs serving in Turkey during the COVID-19 pandemic experienced high levels of depression</p>	<p><b>53</b></p>

<p>distress and insomnia and related factors in healthcare workers during COVID-19 pandemic in Turkey. <i>Journal of Community Health</i>, 45 (6), 1168-1177.</p> <p>(18)</p>				Impact of Event Scale-Revised	insomnia symptoms, and 717 (76.4%) distress symptoms.	, anxiety, insomnia, and distress symptoms	
<p>Badahdah, A., Khamis, F., Al Mahyijari, N., Al Balushi, M., Al Hatmi, H., Al Salmi, I., ... &amp; Al Noomani, J. (2020). The mental health of health care workers in Oman during the COVID-19</p>	<p>July 8, 2020</p>	<p>509 physicians (38.1%) and nurses (61.9 %) <b>In health facilities in Oman</b></p>	<p>a cross-sectional web-based survey of HCWs during the first 2 weeks of April 2020. <b>Oman</b></p>	<p><b>Generalized Anxiety Disorder Scale Perceived Stress Scale World Health Organization Perceived Well-Being Index</b></p>	<p>The findings revealed a pessimistic portrait of the mental health of HCWs in Oman. Based on the GAD-7, one in four (26%) HCWs suffered either from moderate or severe anxiety. If we combine the mild, moderate and severe anxiety categories, two-thirds</p>	<p>high prevalence of stress, anxiety and poor psychological well-being,</p>	<p><b>29</b></p>

<p>pandemic. <i>International Journal of Social Psychiatry</i>, 00207640 20939596. (19)</p>					<p>(65%) of the sample had some degree of anxiety. Stress level was high among our participants, especially among females, and young HCWs.</p>		
<p>Si, M. Y., Su, X. Y., Jiang, Y., Wang, W. J., Gu, X. F., Ma, L., ... &amp; Qiao, Y. L. (2020). Psychological impact of COVID-19 on medical care workers in China. <i>Infectious diseases of poverty</i>, 9(1), 1-13. (20)</p>	<p>12 August 2020</p>	<p>863 medical care workers from seven provinces in China</p>	<p>February 23 to March 5, 2020, a cross-sectional survey</p>	<p>Impact of Event Scale-6 (IES-6), Depression, Anxiety and Stress Scale(DASS)</p>	<p>Posttraumatic stress (PTS) were prevalent in this sample of health care professionals, and 40.2% indicated positive screens for significant posttraumatic stress disorder symptoms. The proportion of having mild to extremely severe symptoms of depression, anxiety and stress were 13.6, 13.9 and 8.6%, respectively. Perceived</p>	<p>stress, anxiety, depression and PTS</p>	<p><b>36</b></p>

					threat and passive coping strategies were positively correlated to PTS and DASS scores, while perceived social support and active coping strategies were negatively correlated to DASS scores. Nurses were more likely to be anxious than others among medical care workers during the COVID-19 epidemic.		
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